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SOME NOTES ON THE DRUMMING OF THE RUFFED GROUSE.

BY H. E. TUTTLE.

Plate XI.

SOME controversies die hard, and the discussion of the drumming of the Ruffed Grouse is one of them. Happily the observations made by Professor Hodge on his domesticated Grouse settled many mooted points, authenticated the testimony of accurate observers, and lopped the hydra heads of many legends that had long abused the popular intelligence. These notes, taken from my field diaries, are not offered as containing much that is new, nor as a final word on a subject long under discussion, but rather as the faithful record of a quest pursued.

UPPER PENINSULA, HURON MOUNTAIN, MICHIGAN, *April 7-13, 1910.* After crawling some distance toward the log on which he was strutting, I watched a cock Grouse drum at a distance of twenty feet. When about to drum the feet were shifted uneasily for a moment, as if to get a firmer grip of the log, the tail was spread and held in a horizontal position. At the beginning of the first wing beat the tail was dropped, and acted as a brace, across or along the log, according to the way the bird was standing. There were three quick preliminary wing beats, then the breast and neck were swelled perceptibly, the feathers on the throat being "ruffed"

the wrong way, the ruffs were slightly distended, and the first loud wing beat was begun. After drumming the tail was held erect for a moment and the ruffs were spread — a beautiful pose.

On moving my hand from behind the stump where I was concealed, he threw up his ruffs, spread his tail into a fan, puffed out his breast, trailed his wings, and with lowered crest walked up the log, turning and hissing. Afterwards he walked off the log and began feeding.

I watched this bird and one other drum more than a dozen times. There were variations in the strutting and in the raising or lowering of the crest, but otherwise the performances were identical. In this region drumming cocks were numerous, the logs on which they drummed being in most cases not ten feet off the trails. The birds were tame and easily approached.

SIMSBURY, CONNECTICUT, *April 23-24, 1910.* I spent the night of the twenty-third and morning of the twenty-fourth on the ground about one hundred yards from a well used drum log. I had set up my camera during the late afternoon, and because the bird was too shy to be approached by crawling, I adopted the expedient of sleeping at the end of my shutter thread.

The Grouse drummed from one-fifteen in the morning till after two o'clock, when I went to sleep, and was still drumming at three minute intervals when I woke at four. He may have rested while I slept, but I woke to the sound of his drumming. He drummed twelve times in thirty minutes, from one-fifteen to one-forty-five. It was rather weird to hear a Grouse drumming in the dark. A bright moon was shining, but the air was misty. A Whippoorwill sang. I woke again at six o'clock, but the Grouse had gone.

SIMSBURY, *May, 1910.* During May in the woods beyond the hill swamp I crawled to the upturned end of a tree behind which a Grouse was drumming. After the bird had drummed three times I ventured to peek around the earthwork and was surprised to find the bird's tail braced across the log about ten inches from my face. The temptation to grab it and tweak out a feather almost overcame me with laughter, but I was eager to hear the bird drum again. I was disappointed at being behind him, where I could not watch his wings and breast, but it was obvious that this was the only position where I could hope to remain unseen. As it

was I retired behind the breastwork. He drummed again. The sound is comparatively faint when heard at close range, and difficult to describe. The silky rustle of the stiff wing feathers on the air is almost louder than the first "beat." "*Fiffump fump, Fffump — Ffump — Fump —.*" The first three, which are very faint, can best be imitated by accentuating the "f" sound as the breath is expelled, like an exhaust pipe.

Suddenly he became aware of my presence, and with an explosive series of "Quit-quits" he flew to the low branch of a tree, about six feet above my head. There he continued to scold for some time, until grown tired of watching him, I rose to my feet, and he rocketed through the second growth like a bullet.

It has always been my experience that if I have been discovered by a Grouse, when lying at full length on the ground, the bird, though alarmed or annoyed, rarely takes flight, but usually indulges in argument.

SIMSBURY, *April 15, 1918.* Today I stalked a cock Grouse that was drumming on the old toboggan slide log, but as I made my last advance he saw me at the same instant that I saw him. He stood stiffly, just as he was when he ceased to drum, all five feathers of his crest separately erect and forward, his ruffs showing plainly, so that I could even see the metallic green edges of the plumes, but he was evidently worried, and turned his head slowly away. Then without warning he whirred off, to alight on the side hill about a gun shot distant.

I noted particularly how short the bill seems when the crest is erect, as compared with the longer appearance that it has when the feathers lie flat to the head, as in the brooding female. In the afternoon I set up my camera within four feet of the log in the hope of a chance shot on the following day.

April 16. No luck with the Grouse. He either did not drum, or drummed elsewhere.

April 17. I secured a very fair photograph of the cock Grouse. The morning was overcast and the light very poor, and as I had set the shutter for a fiftieth part of a second I did not expect to be able to distinguish much on the plate; but, though underexposed, the bird shows up plainly and in sharp focus. He drummed just before I reached the end of my shutter thread (about forty yards

from the camera and concealed from the bird by a little rise of ground) and I spent ten anxious minutes wondering if he had heard me and become alarmed, or whether he had seen the thread tremble as I took hold of it. At the three preliminary drum beats I slowly pulled the thread, but there was so much slack to take up that the shutter did not go off till just before the "roll."

April 18-May 1. A series of failures followed. On two occasions the shutter was sprung during the night, either by a branch blown against the thread by the wind, or by some one who like myself enjoys wandering from the beaten path. Rain precluded two other attempts, and the Grouse, becoming shy, sought another log some five hundred yards to the east, where after following his booming challenge I discovered him during the last days of April. The situation was more favorable to photography, for the log lay at the top of a ridge, broadside to the east, and caught whatever rays of light penetrated the second growth when the sun rose over the gap in the hills. After one partially successful attempt with a thread nearly one hundred yards long, and two failures, I decided to pursue another method. If the Grouse would accept a blind, I should be able to choose the pose I most desired, suit the time of the exposure to the light conditions, and observe the drumming at fairly close range. I therefore set up and concealed my camera about four feet from the position on the log where the Grouse was accustomed to drum, and pitched my blind some twenty-five feet to the east.

May 2. At a quarter before four (sun time) I set out for the second growth ridge and the drum log of the Ruffed Grouse. The moon was still shining when I left the house, and I could see my shadow by its light as I crossed the home field. Robins were singing and an occasional Red-winged Blackbird flew overhead. Early as I was, I was too late, for with a whistled alarm note the Grouse flushed from the log as I made my way through the woods toward the blind. After a wait of forty minutes I heard him stepping over the dry leaves, and shortly after, the four preliminary wing beats boomed out. Up to this time I had not dared to move sufficiently to glance through the peek hole which I had provided, but now I did so, and saw the Grouse sitting hunched up in a little ball upon the log.

I had set the shutter for a fifth of a second exposure and had not planned to take the bird as he drummed, but the temptation was too strong, and as there was light enough (at five minutes after five) I waited till I saw the wings flash out in the first beat, and then pulled the shutter thread. His wings thumped twice while the shutter opened and closed, so that I had little hope of a clear-cut image on the plate, but the developed negative shows with what steadiness the bird holds himself during the drumming, for while the wings are blurred, the head is sharp and shows no trace of movement.

The Grouse preened himself twice, running his mandibles over his ruffs, the feathers of his rump and each long tail feather. Several times he turned about as if to go, and then like one overcome by an irresistible temptation, he would face about quickly, brace his feet on the accustomed piece of bark, and begin to drum. He left the log at six o'clock.

The performance did not differ essentially from others that I had witnessed, except that this bird took four preliminary wing beats instead of three. His crest was erect throughout the drumming, the ruffs partly, but not prominently, displayed. One of the Michigan birds whose drumming I observed, did not elevate his crest until the conclusion of the "roll."

May 3. Although I entered the blind at three-forty-five, the Grouse flushed from the log. If he roosted there he must have gone to roost late, as I did not finish setting up my second camera till after seven o'clock of the night before.

As I sat in my blind waiting for the Grouse to return, a Whip-poorwill sang and either this Grouse or another drummed in the birch glade below the ridge. A Chewink called. There was a chorus of Robin's voices which almost drowned the hymn of a Hermit Thrush, but could not dampen the ardor of a Chickadee.

The Grouse did not return till four-fifty, when I heard his heavy footfall, and the scratching noise made by his toe nails on the log as he ascended it. Walking a few steps along the log until he came to the spot where a loose piece of bark offered a convenient foothold, he struck a pose. The wings flashed out, hung limp, and flashed out again. There was a pause in which he seemed to gird his loins for the blows that were to follow, then beat followed beat till the

outlines of the wings were lost in the ecstasy of the "roll." I waited till five-fifteen for my first picture, and on the first sign of uneasiness on his part (significant of the fact that he was about to drum), I made the thread taut. At the first shift of his wings, I pulled. He saw the movement of the thread and held the pose while the shutter clicked at one fifth of a second. I took the second picture with the camera set for a side view, at five-thirty, selecting almost the same pose. He again detected the movement and held his position. As soon as the shutter clicked he continued to drum. He seemed to take only a passing interest in the scream of a Red-shouldered Hawk, but manifested an unusual degree of pleasure or curiosity in the song of a Bobolink as it flew overhead. He cocked his head on one side and apparently watched the course of its flight. He noticed the slightest noises and would turn his head at the scratching of my pencil as I wrote up these notes, though the blind was twenty-five feet distant from the log. Occasionally, in the intervals between drummings, his breast puffed out and his head shot forward, as if he were being relieved of gas on his stomach or had the hiccoughs. (This happened once on both mornings.) He drummed every seven minutes, though the interval was sometimes longer, particularly if he had heard a suspicious sound. When alarmed he drew himself up and stretched his neck to its full height. Sometimes before drumming he acted as if he were about to leave, turned about and looked for a convenient descent to the ground. Then, as if reluctant to go, or as if determined on just one more performance, he turned, braced himself, and began to drum.

May 8. I arrived in the blind at two-fifty, and began my silent vigil. The Grouse appeared at four-twenty-five, hurried along the log, as if late for an appointment, and at once began to drum. He drummed four times by four-thirty, and seven times by forty-two. Just before the seventh time he dropped off the log, and I was afraid that I had lost my chance to photograph him, but he immediately returned to his post and drummed. I think he picked up a grub or some live food that had caught his eye.

After drumming the tail is flung up stiffly for a moment. I have never observed a more alert and watchful bird, and he seemed even more watchful on this morning than on previous occasions. At

five-thirty I took my first picture, from the front, springing the shutter just after the four preliminary wing beats had been followed by the first two of the faster series. The wings moved once or twice during the exposure, which resulted in a failure, being badly blurred. At five-thirty-two I made my second exposure, from the side, just after the Grouse had finished drumming. I thought that he moved, but the plate showed that he did not, and this exposure proved to be one of the best that I have made.

The Grouse had drummed twenty-seven times when the rain began at six-seven. I was curious to see if he would weather it out or take shelter. He drummed again, the ruffs well out, rising and falling on the pulsing breeze caused by the wings. The leaves in front of the log are frequently scattered by the force of the final outburst. He drummed again. It was raining in earnest now, and he was drumming in the pouring rain. At six-thirty he left the log and walked directly toward the blind, pausing about two feet away to turn and round it. He picked and ate the new green leaves of a blueberry bush, his beak making a most perceptible snap as he pulled them off. He walked as I have always seen Grouse walk when unconscious of observation or danger, the head carried quite low, the tail folded and horizontal. His crest of course was lowered. After plucking the blueberry bush he began pulling at a laurel with which I had concealed the blind. He then walked up and pecked at the material of the tent itself. After circling the blind, still within two foot range, he returned to his log and at once began to drum. I could wait no longer, and retreated from the rear opening, keeping the blind between me and the bird until I was so far away that he should not be greatly alarmed when he first saw me. On catching sight of me he crouched quickly, his head low. For perhaps a minute he trusted to his immobility, then realizing that he was seen, his head shot up and he began to walk slowly down the log, his tail flirting nervously at each step. Taking a final look at me, he dropped off the log on the far side and immediately flushed with a roar of wings.

May 9. I crawled into my blind at three-thirty. Starlight, windy, cold and clear. The Grouse flushed from the log. Whip-poorwills were noisy. The Grouse reconnoitred for an hour, walking all around the blind. Finally satisfied that the coast was

clear, he abandoned his stealthy countermarches and long motionless delays, and hurried with careless steps to the log which seemed to draw him like a magnet.

I waited till five-ten for my first shot at one-fifth of a second, selecting the moment just after drumming, in the hope of catching him with his tail erect. At five-twenty with full sunlight I pulled the second thread at one twenty-fifth, endeavoring to picture him during the pause at the end of the four preliminary wing beats. (The first picture was successful, but the plate in the second had been badly fogged, possibly owing to a defective plate holder. There was no image on it.)

At six o'clock the Grouse was in full sunlight, bright enough for a fast exposure. He scratched his head with his toe, a pose that I should like to have caught. If luck had been with me, an exposure of a fiftieth of a second would have caught him at the end of a wing stroke, as there was a pause of slight duration at the end of each beat. He preened himself, then took one wing beat, and as if unsatisfied with his stance, turned about. The Grouse takes the first beat after partially squatting as if to steady himself. He then draws himself erect and takes four, the last of which often has as much force as the ones that follow. Here there is a slight pause, the upper breast is swelled, and the bird stands even more erect, the body being almost perpendicular, the head thrust forward. In this position the Grouse slightly resembles a pouter pigeon, and suggests Browning's description of Napoleon before Ratisbon, "with neck out-thrust, you fancy how —" The next beat comes with increased volume and is followed by about twenty strokes in ever quickening succession till the "roll." This is made up of ten or possibly twenty beats, rolled into a crescendo that frequently stirs the leaves ten feet in front of the drum log. At the end of the roll the bird stands on tiptoe, the ruffs are prominently displayed, the tail is erect at an angle of forty-five degrees and gradually subsides, first to a horizontal position and then to a position resting on the log, the ruffs slide back into their normal place, and the small feathers on the throat, which are ruffed the wrong way during drumming, become smooth.

The Grouse now hopped off the log on the far side, but the temptation was too strong, and he returned, facing west for a short

space. He then shook himself and hopped off the log again, making his way rather noisily through the woods.

May 12. I moved the blind to within six feet of the drum log. If it is too close to be useful for photography, I shall at least have had the experience of watching a Grouse drum at that range.

May 13. I arrived in the blind at two-forty-five. The Grouse was heard walking about at four and reconnoitred till four-thirty. He then came to the log, manifesting an unusual degree of caution and showed an attitude of great alarm after drumming once, crouching in an attempt to see through the peep hole of the blind. He then drummed again. At five-thirty-five I attempted my first picture, but the shutter thread had become tangled with one of the twigs on the top of the blind, and the Grouse hearing the noise and seeing the movement, instantly stopped drumming and sneaked off the log. I waited till seven, hoping that he would return, which he did. I took one picture with the camera in front at one hundredth of a second. The light was very dull, but I thought it was worth the chance. I tried again to pull the other shutter off, without success. The last time that the Grouse drummed he failed to get a good grip on the log, with the amusing result that the finale of the roll shifted him off his stance and whirled him half way around. (The picture was a bad failure, the plate being fogged and the exposure much too fast. It did show that one hundredth part of a second was fast enough to catch the moving wings.)

May 15. Dawn was not yet gray in the east when I stumbled through the second growth in the darkness and sought my green denim bush. The hour was two-fifty. The Grouse was more suspicious than usual and did not come to the log till four-forty. He drummed once, then left the log and came toward the blind. After walking some ten feet behind the blind, he returned to the log and drummed. An interval, then he drummed again. He was uneasy however, and soon dropped off the log, and passing close to the blind, departed to the rear. After ten minutes he began drumming on a log twenty yards to the east. I think the blind's proximity to the log was too great an obstacle, and in the afternoon I moved it back to a position twenty feet away.

May 16. I reached the blind at two-fifty. The Grouse spent

some time in coming to the log. He arrived on the scene at four-forty, flying down from a tree near the blind. At five-twenty-five I took my first picture, showing a watchful pose. He became alarmed, watched the camera for some time, and finally left the log at five-thirty-five.

May 21. Three o'clock found me in my blind, and at three-ten it began to rain. Rain fell for an hour, dwindled to an occasional drop, but began again at four-forty when the Grouse appeared. He drummed throughout a hard rain at longer intervals than usual. He left the blind at five-thirty, passing within two feet of my eye at the peep hole. I left the blind at six and picked up my cameras. The Oven-Birds sang their flight song before dawn.

It is easier to venture an opinion as to how the drumming sound is *not* produced than it is to make an affirmative answer to a question as to its source, and there has been so much discussion that I hesitate to make any unqualified statement at all. My observations, however, and what photographs I have been able to obtain, only confirm the testimony of Professor C. F. Hodge, who had the advantage of studying tame Grouse, and whose photographs of the drumming of these birds cover a series of poses taken from the front, the side and the rear. His observations and his photographs satisfied him that however the drum beat was produced, it was not caused by the wings striking together behind the bird's back. I do not think anyone who watched the drumming at close range, and from the rear, could be persuaded that the wings struck together behind the bird's back, while I am equally sure that observations made from the front or the side might easily give rise to such an opinion.

What is perhaps the best series of pictures of the drumming of a wild cock Grouse was published in 'Forest and Stream' for April, 1918. The author, Mr. Frederick K. Vreeland, during the course of the article describes the opening wing beat as follows: "A slight elevation of the wings and then they were thrown sharply backward, striking together behind the bird's back with a deep soft 'Boom,' returning almost instantly to the starting position, but with the feathers somewhat spread." Further: "But I did succeed in getting one shot which, while it shows the wings only as a

blur, I think will prove to the most skeptical that they did actually strike together behind the drummer's back." The photograph which is offered in proof of this statement is one taken from the side, so that the blur of the moving wings is shown as extending beyond the upright body of the bird and for about a wing's breadth to the rear. But how could any photograph taken from the side and showing the wings in profile prove whether or not the wings struck together behind the bird's back? The only photograph which could prove the contention, or disprove it, without the corroborative evidence of observation, would be one taken from directly, or almost directly, behind the bird, the result of an exposure sufficiently long to record more than one wing beat. This would of necessity show as much blur in the space between the wings as elsewhere, if the wings came together behind the back to produce the beat. In regard to other photographic evidence, Professor A. A. Allen of Cornell University to whom I wrote concerning a statement that he made in 'American Forestry' (to be quoted later), very rightly contends, I think, that the exposure, unless it be a very slow one, records but a single stroke of the wings, and that the wings may thus be shown in any position without definitely proving that because they are not shown to touch that they do not do so. The photograph which accompanies this article, the result of an exposure made just before the "roll," is open to this objection, but if it fails of being in itself conclusive testimony to the assertion that the wings in drumming do not strike together behind the bird's back, it demonstrates the futility of photographic evidence other than such as I have hypothecated above (i. e. the result of an exposure taken from the rear and slow enough to record more than one wing beat).

Here, I think that observation must lend its weight, and I am so far convinced by my own experience that the wings do not strike together to produce the drum beat that I should be astonished if other observers who had watched as many or more performances than I have, and at close range, should succeed in demonstrating by such a photograph as I have suggested that the wings do actually strike together behind the back of the drumming bird. Should it be proved that the wings do meet, it would still be difficult to prove that the sound was produced by their contact, rather than by the forward stroke against the air.

Professor A. A. Allen, writing in 'American Forestry' for August, 1918, describes the drumming as follows: "The drumming sound, which begins with a measured thump-thump-thump — and ends with a loud whirring sound, like the muffled sound of a motorcycle engine — is made by the cock beating the air with his wings. Bracing himself on the log with his tail and standing erect, he first strikes his wings together behind his back producing the thump-thump-thump noise of a big drum."

In reply to my letter asking how he had arrived at this conclusion he says, — "I have never had the opportunity to watch the grouse at sufficiently close range to determine this for myself and am frank to confess that I based the statement upon the photographs and description which appeared in 'Forest and Stream' and in the 'Bulletin of the American Game Protective Association,' where the bird was watched at close range and observations were apparently made for determining this very point. I was also influenced by the similarity of those first few notes to the sounds produced by pigeons and long-eared owls, which are, I believe, without doubt, made by striking the wings together over the back."

The article on which Professor Allen based his statement (Mr. Vreeland's in 'Forest and Stream' for April, 1918) and the photograph on which this contention was based I have already discussed. The question of similarity of sound is interesting, but, for want of observation in relation to it, is of doubtful value in determining the facts. We come back to such observation as shall be considered authoritative. Of Mr. Vreeland's, putting aside the question of photographic proof already referred to, I can only add, that while he witnessed several performances at close range and secured the best series of photographs of the drumming that I have seen, his observations, as recorded, were made, as were his photographs, from the front of the drumming bird and from the side, positions from which it is well nigh impossible to discern whether the wings strike together or not. Somewhere the truth lies hid, and my purpose in reopening an old discussion is that others may aid in discovering it. When the negative side of the discussion has been settled, however, there still remains the question — if not by this means, how else?

To say, on the positive side, that the sound of the drumming is

essentially the same, and produced in the same way as the roar which accompanies the flight of the Grouse when startled (that is, by the action of the wings on the air), is perhaps an unsatisfactory explanation of that far-away throbbing challenge which steals on the ear so subtly, like the half heard beating of one's own heart. Yet for want of further evidence it must serve. What I should most like to discover is to how great an extent inflation of the rudimentary tympanum serves to enhance the strenuous thrust of the wings which seem to catch the air at the well feathered flanks.

Most of the *Tetraonidae* are possessed of air sacs, located under the neck tufts or ruffs, which when inflated are capable of producing a booming sound of great carrying power, which may be heard while the birds are performing their amatory dances, and it does not seem to me at all impossible that the sound-carrying powers of the drumming of *Bonasa* may in part be traced to an inflation of the rudimentary sacs which it possesses. In this connection observation alone is of little service, though I noticed that in the pause which follows the preliminary wing beats (which have but little sound-carrying power) that the contour of the bird changes perceptibly, the throat and the region of the ruffs is apparently swelled, and the next wing beat comes with increased volume. Mindful of what effects a bird can produce simply by a change in the arrangement of his plumage, I am inclined to think that this "swelling" is of an inflated character. Audubon, by puncturing the air sacs of a captured Pinnated Grouse, satisfied himself that these appendages were the source of the "booming," and perhaps some such experiment with a captive Ruffed Grouse would prove to what extent inflation of these parts plays in the ventriloquial and resonant quality characteristic of this bird's exuberant drumming.

But to me the most significant feature of the drumming is not the question as to the source of its sound-carrying powers, nor the attitudes that the Grouse assumes, though they are interesting, but it is the evidence of the compelling power of habit. (This differs greatly in individuals, and I here confine myself to the individual studied during the spring of 1918.) In spite of the disturbances which occurred owing to my presence in the blind, in spite of the obvious annoyance of the blind itself, especially

when moved to within six feet of the log, in spite of the adversity of the weather, in spite of the countless other logs on which he might have drummed, and on which he had drummed before he fixed his preference on the one which later came under my observation, he continued to arrive at the log within five or ten minutes of the appointed time, hurrying to it, after he had carefully reconnoitred the woods for possible enemies, as if irresistibly drawn by a power over which he had no control. He was obviously reluctant to leave the log when disturbed and usually returned to it, if the hour was still early, as soon as he had satisfied his inherent caution.

I was unable to study to what extent the drumming serves as a mating call, because the hen, whose nest was some two hundred and fifty yards to the north, had finished laying her complement of fourteen eggs on the fifth of May and had begun to set before the third day of my observation. May second and third were the only two days on which I might have seen the birds together at the log, and on neither of these days did the hen appear. On May second, however, after leaving my blind and walking about a hundred yards in the direction in which I had seen the cock disappear, I flushed the cock and another Grouse within a dozen feet of each other. This second bird I feel sure was the hen of the pair, because there were no other Grouse in this particular little second growth swale and because the nest was but a stone's throw away; nor was the hen on the nest when I walked over to it directly after flushing the pair of birds.

Inferences from the bird's attitude while on the log are largely speculation. The watchfulness which he displayed at all times was doubtless quite as much in the interest of his own safety as in the endeavor to discover the presence of his mate, yet there was one characteristic habit that might be interpreted as indicative of the fact that the Grouse was on the lookout for the hen. This was the fact that whenever I made a noise within the blind, such as might have been made by the football of the hen on the leaves, he at once craned his neck in the direction of the sound *and immediately drummed*. I made such a noise several times, with the intention of imitating a bird's footsteps, and on each occasion he displayed a lively interest, quickly followed by an exhibition of his wing power.

The sound to which the Grouse gave instant and invariable attention was the alarm note of the Blue Jay. To the scolding of Robins and even to the cawing of Crows he turned a deaf ear, but the protesting voice of a Jay hushed the sound of the drum note, and a period of silent waiting ensued, during which interval he was evidently at some pains to discover the cause of the Jay's displeasure.

There was a time, when the spring drumming of the Grouse thundered from a hundred hills, woke the echoes like the throbbing tom-toms of tribes upon the war-path and sent the blood sap pulsing quicker along the veins; but laws are useless where they are not enforced, and unless the Ruffed Grouse is given a greater measure of protection, the woods will no longer hear his footfall that might for years have thrilled to the vigorous ardor of his wings.

“THE SINGING TREE,” OR HOW NEAR TO THE NEST
DO THE MALE BIRDS SING?¹

BY H. MOUSLEY.

My attention was first drawn to this interesting subject by my inability to find the nesting sites of warblers, although regarding other species I was more than ordinarily successful. I must admit I was discouraged but not surprised, for to find the nests of these interesting little gems has always been more or less of a gamble to the students of the family *Mniotiltidae*. Of course there are red letter days when by accident one sees a female with building material fly direct to the nesting site, but these are generally few and far between, and in my experience one hardly ever sees the females until the nests are discovered. It is the males that are always in evidence, not only during the nesting season, but also at migration times, and I can well remember the day when the

¹ Read before the Nuttall Ornithological Club by Dr. Chas. W. Townsend for the Author, Oct. 21, 1918.